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EXAMINER	
PHAM, KHANH B	

ART UNIT	PAPER NUMBER
2166	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/830,164	AVADHANAM ET AL.	
	Examiner	Art Unit	
	Khanh B. Pham	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

2. Applicant's submission filed on 1/15/2008 has been entered. Claims 1, 10, 14, 18, 20, and 24 have been amended. Claims 27-28 have been canceled. Claims 1-26 are pending in this Application.

Claim Objections

3. Claim 7 is objected to because of the following informalities: at the end of line 1, "and" should be replaced with "an". Appropriate correction is required.

4. Claim 14 is objected to because of the following informalities: Claim 7 recites the limitation "the step of determining" in line 6. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al. (US 6,438,562), and in view of Blank et al. (US 5,842,208), hereinafter "**Gupta**" and "**Blank**", respectively.

As to claim 1, 12, 18, and 20, Gupta teaches 'a method of creating an index for a database table of records [col. 2, line 21-23, col. 3, line 45-47 fig 2-3], database table corresponds to fig 2, table 200; index corresponds to fig 3, element 300 the method occurring in a computer environment having a plurality of processing units [fig. 1, fig. 7] wherein each processing unit has access to the table [col. 2, line 41-44], Gupta specifically teaches relational storage where relational databases store data records in indexed tables as detailed in fig 2-3, plurality of processing units corresponds to Gupta's fig 1 and fig 7 ;

determining partition delimiters, each partition delimiter separating the table into non-overlapping partitions of records [col. 14, line 35-38, fig 7], each partition delimiter separating the table into non-overlapping partitions of records corresponds to Gupta's fig 7, partitions A 161, B162, and C 163; 'each partition dedicated to one processing unit for index creation' [col. 14, line 44-50, line 54-56], each partition dedicated to one processing unit for index creation corresponds to Gupta's index fig 7, element 711, 712, 713, and 714 ;

wherein the step of determining comprises sampling the table records to determine an approximate distribution of at least one key value in the record' [Col. 15, line 35-47, line 66-67, Col. 16, line 1-13], Gupta specifically teaches sampling of "S" records of the index maintenance records to compute good statistical representation of the population chosen for "S" records, also suggested that every fifteenth record is sampled during the PDML operations, it is also noted that "ranges are defined by reading the "key values" associated with each multiple of S*/N from the sorted records as detailed in fig 8, particularly "distributing work based on index key value ranges" [see Col. 15];

accessing the table records in parallel, wherein each processing unit accesses each of the records [col. 8, line 1-13], Gupta teaches data manipulation operations specifically each data slave accessed to perform data manipulation i.e., processing data records and updating the index maintenance records as detailed in col. 8, line 1-13;

filtering the accessed records in parallel, wherein each processing unit determines which records to keep '[col. 7, line 45-51; col. 12, line 21-27, col. 13, line 37-39], Gupta specifically teaches accessing index ID value that identifies the specific index associated with the data records to be changed as detailed in col. 12, line 21-27 independently creating a plurality of sub-indexes, wherein at least two sub-indexes are created by different processing units' [col. 3, line 45-52, col. 12, line 58-63,.line 64-67, col. 13, line 18-25, col. 14, line 54-61], Gupta specifically teaches each index record corresponds to a row [see fig 6], further index maintenance records indicate changes that need to be made to indexes in response to changes that are made to the

table [col. 12, line 58-63],that corresponds to independently creating indexes or sub-indexes, further to keep separate the changes to the two indexes, the index maintained records are modified to include the index ID as detailed in fig 6, element 611. It is also noted that sub-indexes are part of B-tree element 300 because B-tree is arranged in hierarchical structure, further each node or branch in the B-tree structure associated with index key [col. 3, line 45-53];

'storing the final index' [col. 20, line 57-60], Gupta specifically teaches storing index records related to global index particularly sorted version of the index maintenance records as detailed in col. 20, line 57-60.

It is however, noted that Gupta does not specifically teach 'merging the sub-indexes together to create, a final index related to the table', although Gupta specifically teaches coordinating an update of a global index of an indexed table and updates the global index using the current index maintenance record [col. 7, line 41-42], further Gupta also suggests index maintenance records using "data manipulation operations among parallel data manipulation slaves for example fig 5, element 510, the data manipulation operations including updating col. 14, line 46-47], inserting, deleting [col. 13, line 28] sorting [col. 16, line 36-37]and like

On the other hand, Blank et al. disclosed 'merging the sub-indexes together to create, a final index related to the table' col. 3, line 57-67, col. 4, line 1-2], Blank specifically teaches index built system that supports multiple scan program performed in

parallel by multiple processors against multiple partitions [see fig 3], further, in the processing or recover/built index system, multiple merge programs for example fig 4, element 112a-b are performed that merges all the key/rid values. Finally, an index built program 114 is performed to built final index element 116as detailed in fig 1.
It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into parallel index maintenance of Gupta et al. because, both Gupta and Blank are directed to "multiple processors and multiple partitions of database tables [see Gupta fig 1, fig 7; Blank: fig 1, element 102 corresponds to multiple processors, element 120 corresponds to partition], both Gupta and Blank also teaches "indexing and index key [see Gupta: fig 2, col. 13, line 26-40; Blank: col. 2, line 42-48] and both Gupta and Blank specifically suggests "sort" operation [see Gupta: col. 16, line 31-33; Blank: col. 3, line 18-19] and both are from same field of endeavor.

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank into parallel index maintenance of Gupta et al. because that would have allowed user's of Gupta to use "sort program that executing in parallel receive the san streams for each "partition to create sort stream [col. 3, line 5-9], while merge program that merges the sort stream received from the sort program to create a merge stream [col. 3, line 10-15], further merge program built "final indexes" col. 3, line 67, col. 4, line 1-2] bring the advantages of "high performance recover/build index system that reduces the amount of time that takes to built index in

multiple processors [col. 3, line 25-27], furthermore, piping the data between the sort and merge programs improves performance of the system as suggested by Blank et al. [col. 3, line 28-30].

As to claim 2, Gupta disclosed 'wherein the act of creating the sub-indexes [Col. 3, line 45-53], sub-indexes are part of B-tree element 300 because B-tree is arranged in hierarchical structure, further each node or branch in the B-tree structure associated with index key [Col. 3, line 45-53] further comprises sorting the records and generating a data structure based on the sorted records [Col. 8, line 18-26].

As to claim 3, Gupta disclosed wherein the data structure is a B-Tree data structure [Col. 3,line 45-448, Col. 4, line 13-14], B-structure data structure corresponds to Gupta's B-tree fig 3, element 300.

As to claim 4, Gupta disclosed 'wherein the data structure has multiple levels. [fig 3, element 300, Col. 4, line 13-15], B-tree data structure is a hierarchical having root node, leaf nodes.

As to claim 5, Gupta disclosed 'wherein the data structure is a clustered index' [Col. 14, line 23-26], Gupta specifically teaches index will be clustered based on index maintenance records.

As to claim 6, Gupta disclosed 'further comprising gathering sub-index statistical information and stitching sub-index statistical information' [Col. 15, line 35-50, fig 5], Gupta specifically suggests sample of "S" records of the index to give good statistical representation of the population based on number of available nodes as detailed in [Col. 15, line 35-47].

As to claim 7, Gupta disclosed 'wherein the method is initiated by an index creation manager module' [fig 1, element 170,fig 7, element 170], global index corresponds to index module.

As to claim 8, Gupta disclosed 'wherein the method is initiated by a query manager in response to a supplied query' [fig 13, Col. 20, line 66-67, Col. 21, line 1].

As to claim 9, Gupta disclosed 'wherein the method is initiated automatically in response to a modification to the table' [Col. 5, line 38-44, Col. 18, line 53-57, fig 11].

As to claim 10, Gupta disclosed 'wherein the act of determining partition delimiters comprises: creating a histogram based on the sampled information; and evaluating the histogram to determine the partition delimiters [Col. 15, line 39-40].

As best understood by the examiner, a histogram can be constructed by segmenting the range of the data into equal sized, particularly, ranges that are defined in Col. 15, line 66-67, moreover, it is common knowledge that statistics analyzing,

viewing the data in a variety of ways, one possible way is "histogram", "bar graphs", "pie-charts", further, "histograms are sometimes referred to "frequency distribution" which is an integral part of Gupta's "statistical representation of records [Col. 15, line 39-40]

As to claim 11, 13, Gupta disclosed 'determining a processor goal value based on the number of processors in the computer system' [Col. 4, line 52-55]; determining a least common multiple value based on the processor goal value [Col. 6, line 55-59]; 'determining whether the histogram information may be substantially evenly split into the least common multiple value number of partitions' [Col. 6, line 59-65,Col. 13, line 57-61]; if so, creating the partition delimiters based on the least common multiple value' [Col. 13, line 66-67]; and if not, adjusting the processor goal to determine a new least common multiple value to determine partition delimiters' [Col. 14, line 3-8].

As to claim 14, Gupta teaches a system which including 'a system for database table index creation for a database table [fig 1, Col. 4, line 57-61], database table corresponds to fig 1, database table], the database table stored in memory and comprising a plurality of records [fig 1-2, element 151-153], the system comprising:

a partition tool that determining partition delimiters, each partition delimiter separating the table into non-overlapping partitions of records [col. 14, line 35-38, fig 7], each partition delimiter separating the table into non-overlapping partitions of records corresponds to Gupta's fig 7, partitions A 161, B162, and C 163; 'each partition

dedicated to one processing unit for index creation' [col. 14, line 44-50, line 54-56], each partition dedicated to one processing unit for index creation corresponds to Gupta's index fig 7, element 711, 712, 713, and 714 ;

wherein the step of determining comprises sampling the table records to determine an approximate distribution of at least one key value in the record' [Col. 15, line 35-47, line 66-67, Col. 16, line 1-13], Gupta specifically teaches sampling of "S" records of the index maintenance records to compute good statistical representation of the population chosen for "S" records, also suggested that every fifteenth record is sampled during the PDML operations, it is also noted that "ranges are defined by reading the "key values" associated with each multiple of S*/N from the sorted records as detailed in fig 8, particularly "distributing work based on index key value ranges" [see Col. 15];

a plurality of processing units that respectively accesses the database table in parallel, [fig 1, Col. 4, line 43-48] wherein each of the respective processing units accesses each of the records [Col. 8, line 1-13], Gupta teaches data manipulation operations specifically each data slave accessed to perform data manipulation i.e., processing data records and updating the index maintenance records as detailed in Col. 8, line 1-13;

and 'filters the accessed records to determine which records to keep'[Col. 7, line 45-51; Col. 12, line 21-27, Col. 13, line 37-39], Gupta specifically teaches accessing

index ID value that identifies the specific index associated with the data records to be changed as detailed in Col. 12, line 21-27;

'wherein each of the respective processing units creates a sub-index of database table records resulting in a plurality of sub-indexes'; [Col. 3, line 45-52, Col. 12, line 58-63, line 64-67, Col. 13, line 18-25, Col. 14, line 54-61], Gupta specifically teaches each index record corresponds to a row [see fig 6], further index maintenance records indicate changes that need to be made to indexes in response to changes that are made to the table [Col. 12, line 58-63],that corresponds to independently creating indexes or sub-indexes, further to keep separate the changes to the two indexes, the index maintained records are modified to include the index ID as detailed in fig 6, element 611. It is also noted that sub-indexes are part of B-tree element 300 because B-tree is arranged in hierarchical structure, further each node or branch in the B-tree structure associated with index key [Col. 3, line 45-53]

'a store tool that stores the final database table index' [Col. 20, line 53-62].

It is however, noted that Gupta et al. does not specifically teach 'merge tool that merges the plurality of sub-indices into a final database table index', although Gupta specifically teaches coordinating an update of a global index of an indexed table and updates the global index using the current index maintenance record [Col. 7, line 4i-42], further Gupta also suggests index maintenance records using "data manipulation operations among parallel data manipulation slaves for example fig 5, element 510, the

data manipulation operations including updating Col. 14, line 46-47], inserting, deleting [Col. 13, line 28] sorting [Col. 16, line 36-37]

On the other hand, Blank et al. disclosed 'merge tool that merges the plurality of sub-indices into a final database table index' Col. 3, line 57-67, Col. 4, line 1-2], Blank specifically teaches index built system that supports multiple scan program performed in parallel by multiple processors against multiple partitions [see fig 3], further, in the processing or recover/built index system, multiple merge programs for example fig 4, element 112a-b are performed that merges all the key/rid values. Finally, an index built program 114 is performed to built final index element 116 as detailed in fig 1.

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into parallel index maintenance of Gupta et al. because, both Gupta and Blank are directed to "multiple processors and multiple partitions of database tables [see Gupta fig 1, fig 7; Blank: fig 1, element 102 corresponds to multiple processors, element 120 corresponds to partition], both Gupta and Blank also teaches "indexing and index key [see Gupta: fig 2, Col. 13, line 26-40; Blank: Col. 2, line 42-48] and both Gupta and Blank specifically suggests "sort" operation [see Gupta: Col. 16, line 31-33; Blank: Col. 3, line 18-19] and both are from same field of endeavor.

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into parallel index maintenance of Gupta et al. because that would have allowed user's of Gupta et al. to use "sort program that executing in parallel receive the san streams for each "partition to create sort stream [Col. 3, line 5-9], while merge program that merges the sort stream received from the sort program to create a merge stream [Col. 3, line 10-15], further merge program built final indexes" Col. 3, line 67, Col. 4, line 1-2] bring the advantages of "high performance recover/build index system that reduces the amount of time that takes to built index in multiple processors [Col. 3, line 25-27], furthermore, piping the data between the sort and merge programs improves performance of the system as suggested by Blank et al. [Col. 3, line 28-30],

As to claim 15, Gupta disclosed 'a filter module that filters the accessed records and selectively predetermined records"[Col. 7, line 45-51; Col. 12, line 21-27, Col. 13, line 37-39], Gupta specifically teaches accessing index ID value that identifies the specific index associated with the data records to be changed as detailed in Col. 12, line 21-27, Col. 20, line 66-67, Col. 21, line 1-4, fig 13] ; and a sorting module that sorts records kept by the filter module into a sub-index' [Col. 16, line 31-33]. On the other hand, Blank disclosed 'a scanning module that scans the database table' [fig 1, element 108,fig 2, element 200], Blank specifically teaches both scan and sort operations as detailed in fig 2.

As to claim 16, Blank disclosed 'scanning module, filter module and sorting module, for each processing unit, operate concurrently' [fig 1-2,fig 4,Col. 3, line 55-67].

As to claim 17, Gupta disclosed 'a sampling module for sampling the database table and a partition module for dividing the records into substantially equal quantities related to the number of processing units' [Col. 15, line 35-47].

As to claim 19, Gupta disclosed 'upon determining that the accessed table record is not associated with the at least one partition dedicated to the first processing unit, passing the accessed record to the second processing unit for index creation' [Col. 16, line 34-46].

As to claim 21, 25, Gupta disclosed wherein the act of allocating portions of the disk allocates a predetermined number of blocks, the predetermined number of blocks is determined during the determination of the partition delimiters' [Col. 11, line 61-67, Col. 12,line 1-7].

As to claim 22, 26, Gupta disclosed 'wherein the allocation of portions of the disk comprises: maintaining a cache of allocated pages and allocating pages for each partition in the cache for each processing unit' [Col. 3, line 6-15, fig 1]

retrieving a pre-determined number of database pages upon request, Col. 3,

line 15-18] wherein the number of pages to allocate upon each request is determined by the size of the cache [Col. 3, line 19-26].

As to claim 23, Gupta disclosed 'wherein the cache has a size depending on the size of the index being built and the number of currently available free pages in the system' [Col. 6, line 24-33].

As to claim 24, Gupta teaches a system which including 'In a computer system having a plurality of processors' [fig 1, element 111,112,113,114], an index creation system for creating an index of information for a table of data records' [fig 1, element 170] 'a sampling module that samples the table of data records to determine sub index delimiters' [[Col. 15, line 35-47, line 66-67, Col. 16, line 1-13], Gupta specifically teaches sampling of "S" records of the index maintenance records to compute good statistical representation of the population chosen for "S" records, also suggested that every fifteenth record is sampled during the PDML operations, it is also noted that "ranges are defined by reading the "key values" associated with each multiple of S*/N from the sorted records as detailed in fig 8, particularly "distributing work based on index key value ranges" [see Col. 15]; further it is noted that Gupta also specifically teaches "partitioned" database tables as detailed in fig 1 and fig 7;

wherein the sub-index delimiters are used as partition delimiters separating the table into non-overlapping portion of record' [col. 14, line 35-38, fig 7], each partition

delimiter separating the table into non-overlapping partitions of records corresponds to Gupta's fig 7, partitions A 161, B162, and C 163

' two or more index creation modules, each index creation module associated with a processor, each index creation module creates a sub-index'
[Col. 3, line 37-65, Col. 4, line 13-24]i

an access module that accesses each of the data records from the table of data records [Col. 8, line 1-13], Gupta teaches data manipulation operations specifically each data slave accessed to perform data manipulation i.e., processing data records and updating the index maintenance records as detailed in Col. 8, line 1-13;

'a filter module that filters data records according the sub-index delimiters to keep only relevant data records' '[Col. 7, line 45-51; Col. 12, line 21-27, Col. 13, line 37-39], Gupta specifically teaches accessing index ID value that identifies the specific index associated with the data records to be changed as detailed in Col. 12, line 21-27

'a sorting module that sorts the relevant data records into a sub- index' [Col. 3, line 45-53], sub-indexes are part of B-tree element 300 because B-tree is arranged in hierarchical structure, further each node or branch in the B-tree structure associated

with index key [Col. 3, line 45-53] further comprises sorting the records and generating a data structure based on the sorted records [Col. 8, line 18-26].

'a store module that stores the final index' [Col. 20, line 56-60].

It is however noted that Gupta does not specifically teach 'a merge module that merges the sub-indexes into a final index', although Gupta specifically teaches coordinating an update of a global index of an indexed table and updates the global index using the current index maintenance record [Col. 7, line 41-42], further Gupta also suggests index maintenance records using "data manipulation operations among parallel data manipulation slaves for example fig 5, element 510, the data manipulation operations including updating Col. 14, line 46-47], inserting, deleting [Col. 13, line 28] sorting [Col. 16, line 36-37].

On the other hand, Blank et al. disclosed 'a merge module that merges the sub-indexes into a final index" Col. 3, line 57-67, Col. 4, line 1-2], Blank specifically teaches index built system that supports multiple scan program performed in parallel by multiple processors against multiple partitions [see fig 3], further, in the processing or recover/built index system, multiple merge programs for example fig 4, element 112a-b are performed that merges all the key/rid values. Finally, an index built program 114 is performed to built final index element 116as detailed in fig 1.

It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into parallel index maintenance of Gupta et al. because, both Gupta and Blank are directed to "multiple processors and multiple partitions of database tables [see Gupta fig 1, fig 7; Blank: fig 1, element 102 corresponds to multiple processors, element 120 corresponds to partition], both Gupta and Blank also teaches "indexing and index key [see Gupta: fig 2, Col. 13, line 26-40; Blank: Col. 2, line 42-48] and both Gupta and Blank specifically suggests "sort" operation [see Gupta: Col. 16, line 31-33; Blank: Col. 3, line 18-19] and both are from same field of endeavor.

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank into parallel index maintenance of Gupta et al. because that would have allowed user's of Gupta to use "sort program that executing in parallel receive the san streams for each "partition to create sort stream [Col. 3, line 5-9], while merge program that merges the sort stream received from the sort program to create a merge stream [Col. 3, line 10-15], further merge program built "final indexes" Col. 3, line 67, Col. 4, line 1-2] bring the advantages of "high performance recover/build index system that reduces the amount of time that takes to built index in multiple processors [Col. 3, line 25-27], furthermore, piping the data between the sort and merge programs improves performance of the system as suggested by Blank [Col. 3, line 28-30],

Response to Arguments

7. Applicant's arguments filed January 15, 2008 have been fully considered but they are not persuasive. The examiner respectfully traverses applicant's arguments.

Regarding claim 1, applicant argued that "there is no suggestion in Gupta that "each of the slaves accesses each record in the table. Rather, each slave process in Gupta receives only the maintenances records within it ranges". The examiner respectfully disagrees for the following reasons:

First, Claims 1 does not recite "each record in the table"; claim 1 at line 8-9 recites : "accesses each of the records", and line 5 of claim 1 recites "non-overlapping partitions of records". Therefore, "the records" at line 9 corresponds to "non-overlapping partitions of records". Gupta teaches that each slave process receives only the records within it ranges (i.e. partition) and anticipates this limitation.

Second, each record does not necessary mean all record, Gupta teaches that each slave process receives only the records within it ranges (i.e. partition) and therefore anticipates this limitation.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine,* 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones,* 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Gupta is directed

to parallel index maintenance, more specifically in a typical database system environment creating not only rows, column in a table, but also particularly creating "indexes" in order to improving the efficiency of data retrieval [see col. 3, line 29-31], secondly, Gupta specifically teaches assigning "key" to the index i.e., assigning specific index IDs in a "B-tree" structure [see fig 3, col. 3, line 45-56], thirdly, Gupta specifically teaches each index record corresponds to a row [see fig 6, col. 12, line 28-36], i.e., index maintenance records where each index entry identified by "key value", further index maintenance records indicate changes that need to be made to indexes in response to changes that are made to the table [col. 12, line 58-63] that corresponds to independently creating not only indexes having identified with index IDs, but also creating and maintaining "sub-indexes" and related records.

It is noted that Blank et al. is directed to recover/build index system, more specifically, building index in a database file in parallel to retrieve "key values" and their associated record identifier values [see Abstract], further Blank also specifically teaches various functions such as scan partitions, sort, merge the sort streams and building index using the merge streams [see fig 2, col. 3, line 5-15].

It is however, noted that Gupta does not specifically teach 'merging the sub-indexes together to create, a final index related to the table', although Gupta specifically teaches coordinating an update of a global index of an indexed table and updates the global index using the current index maintenance record [col. 7, line 41-42], further Gupta also suggests index maintenance records using "data manipulation operations among parallel data manipulation slaves for example fig 5, element 510, the

data manipulation operations including updating col. 14, line 46-47], inserting, deleting [col. 13, line 28] sorting [col. 16, line 36-37] and like

On the other hand, Blank et al. disclosed 'merging the sub-indexes together to create, a final index related to the table' col. 3, line 57-67, col. 4, line 1-2], Blank specifically teaches index built system that supports multiple scan program performed in parallel by multiple processors against multiple partitions [see fig 3], further, in the processing or recover/built index system, multiple merge programs for example fig 4, element 112a-b are performed that merges all the key/rid values. Finally, an index built program 114 is performed to built final index element 116as detailed in fig 1.
It would have been obvious to one of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into parallel index maintenance of Gupta et al. because, both Gupta and Blank are directed to "multiple processors and multiple partitions of database tables [see Gupta fig 1, fig 7; Blank: fig 1, element 102 corresponds to multiple processors, element 120 corresponds to partition], both Gupta and Blank also teaches "indexing and index key [see Gupta: fig 2, col. 13, line 26-40; Blank: col. 2, line 42-48] and both Gupta and Blank specifically Suggests "sort" operation [see Gupta: col. 16, line 31-33; Blank: col.3, line 18-19] and both are from same field of endeavor.

One of the ordinary skill in the art at the time of applicant's invention to incorporate the teachings of Blank et al. into Parallel index maintenance of Gupta et al. because that would have allowed user's of Gupta to use "sort program that executing in parallel receive the san streams for each "partition to create sort stream

[col. 3, line 5-9], while merge program that merges the sort stream received from the sort program to create a merge stream [col 3, line 10-15], further merge program built "final indexes" col. 3, line 67, col. 4, line 1-2] bring the advantages of "high performance recover/build index system that reduces the amount of time that takes to built index in multiple processors [col. 3, line 25-27], furthermore, piping the data between the. sort and merge programs improves performance of the system as suggested by Blank et al. [col. 3, line 28-30],

In light of the foregoing arguments, the 35 U.S.C 103 rejection is hereby sustained.

Conclusion

Examiner's Note: Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the Claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

The prior art made of record, listed on form PTO-892, and not relied upon, if any, is considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed in this action, please contact Lisa Craney whose telephone number is **(571) 272-3574** for faster service.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Pham whose telephone number is (571) 272-4116. The examiner can normally be reached on Monday through Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Khanh B. Pham/
Primary Examiner
Art Unit 2166

March 13, 2008